

STATUS OF INDIAN GREY WOLF *CANIS LUPUS PALLIPES* AND ITS CONSERVATION IN MARGINAL AGRICULTURAL AREAS OF SOLAPUR DISTRICT, MAHARASHTRA¹

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(With two text-figures)

Key words: Indian grey wolf, *Canis lupus pallipes*, status, conservation, Solapur, Deccan, Maharashtra

We conducted ecological and behavioural studies on the Indian grey wolf *Canis lupus pallipes* for three years in an area of 30 sq. km. at Nannaj in the Jawaharlal Nehru Great Indian Bustard Sanctuary in Maharashtra. After establishment of the Bustard Sanctuary, good protection was given to all wildlife, resulting in an increase of blackbuck *Antelope cervicapra*, which constitutes the major wild prey of the Indian grey wolf. The Sanctuary falls in marginal agricultural areas, with numerous villages and settlements. Therefore, wolf-human conflicts are common, chiefly because of wolf depredation on livestock. Under conservation and soil protection schemes, the State Forest Department has raised more than 500 plantation plots in Solapur district alone. These plantation plots range from 15 to 500 ha and provide excellent cover during summer to the wolf and its prey. These forest plots also serve as undisturbed denning sites. As the Sanctuary mainly comprises a mosaic of crop fields, grazing lands, plantation plots, and settlements, crop damage by increasing numbers of blackbuck is a volatile issue. We have suggested the following conservation measures for the protection of wolves: (i) better protection of the core areas, (ii) protection of the denning sites, (iii) livestock compensation for wolf depredation to reduce wolf-man conflict, (iv) translocation of blackbuck from locally-abundant areas to other suitable unoccupied habitats in the Sanctuary, where the wolf may also colonize. (v) Some measure of compensation for crop-damage by blackbuck should be worked out to reduce human-blackbuck conflict.

INTRODUCTION

There are two subspecies of wolf in India, the Indian grey wolf (*Canis lupus pallipes*) and the Tibetan wolf (*Canis lupus chanco*). The Indian grey wolf (henceforth called wolf in this paper) is found in the plains of central, western, and peninsular India, in isolated pockets in the states of Rajasthan, Bihar, Madhya Pradesh, Gujarat, Maharashtra, Karnataka and Andhra Pradesh. In Maharashtra, the wolf is distributed

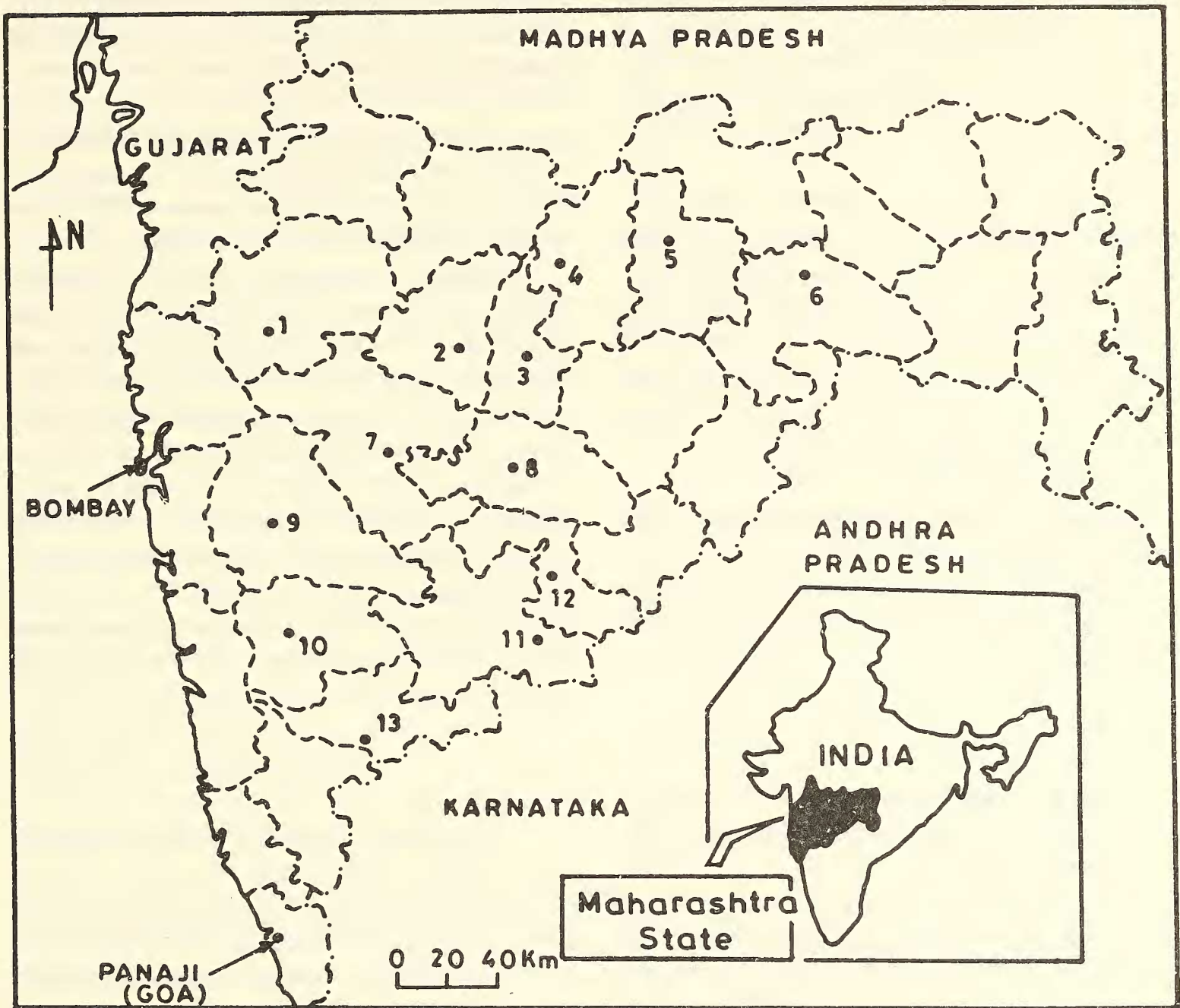
in small pockets of semi-arid areas comprising Nasik, Aurangabad, Jalna, Buldana, Akola, Yavatmal, Ahmednagar, Beed, Pune, Satara, Solapur, Osmanabad and Sangli (Fig. 1).

C. l. chanco is found at high altitudes in the Himalayas in Kashmir, Lahaul Spiti and Sikkim, and Trans-Himalayas (Ladakh and Sikkim) from 3000 to 4000 m. This subspecies is fairly common in Ladakh and is reported to take a heavy toll of livestock and kill large numbers of Tibetan gazelle (*Gazella picticaudata*) and wild sheep (*Ovis ammon hodgsoni*). These wild antelopes and sheep are killed frequently during winter when they descend to lower altitudes because of heavy snowfall (Ganhar, 1979).

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Key

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|----|------------|-----|-----------|
| 1. | Nasik | 8. | Beed |
| 2. | Aurangabad | 9. | Pune |
| 3. | Jalna | 10. | Satara |
| 4. | Buldana | 11. | Solapur |
| 5. | Akola | 12. | Osmanabad |
| 6. | Yavatmal | 13. | Sangli |
| 7. | Ahmednagar | | |

Fig. 1. Map showing the districts of Maharashtra inhabited by the grey wolf.

The habitat of wolf in India is semi-arid dry grasslands, scrublands, grazing land and rocky low hills. The grazing lands lie mainly in the marginal agricultural areas. There is tremendous livestock pressure on these areas because of the continuous increase in livestock, which to some extent contributes to the decline of the wolf's prey.

Except for the preliminary surveys by Shahi (1982) and studies on wolf in Velavadar National Park in Gujarat (Jhala 1991, Jhala and Giles, 1991), there is lack of information on the ecology of this subspecies in other areas of its distribution, while on the Tibetan wolf, nothing exists on its ecology and population estimates in India (Mech, 1982). The present paper is a part of the larger studies conducted on the ecology of the wolf in the Jawaharlal Nehru Great Indian Bustard Sanctuary, Nannaj, Solapur and our objective is to investigate and provide basic information on the status of the wolf population.

STUDY AREA

Solapur, with an area of 15,017 sq. km is one of the largest districts of Maharashtra, both in terms of area and human population. It lies in the interior Deccan and is typical of the plateau. The climate is dry and the maximum temperature varies from 25°C in winter to 44°C in summer. Average annual precipitation is erratic and varies from 500 to 724 mm. The year to year fluctuation in rainfall distribution makes the area drought prone.

The terrain is gently undulating, typical of the Deccan. The cropfields are restricted, by and large, to the valleys between the plateau. The habitat is a mosaic of scrubland, grazing land, agriculture fields, human habitations and man-made plantations. Large-scale plantations are being raised by the State Forest Department in all the sub-divisions. The main purpose is to check soil erosion, provide firewood for local people, fodder for cattle and to provide vegeta-

tional cover to soil. These plantations are being made under different agencies such as Drought Prone Areas Programme (DPAP), District Rural Development Agency (DRDA), Employment Guarantee Scheme (EGS), and Tree Planting Scheme (TPS). The chief mountain-passes (ghats) in the district are: Yedshi ghat in Barshi, Waghola and Bodki in Karmala, Chinchgaon in Madha. Gurvad and Phaltan range in Malshiras and the Khanapur-Jat hills in Sangole.

The main crops are sorghum *Sorghum bicolor*, sunflower *Helianthus annuus*, wheat *Triticum aestivum*, sugarcane *Saccharum officinalis*, groundnut *Arachis hypogea* and various pulses. There are orchards of grape *Vitis vinifera* and Indian plum *Zizyphus mauritiana* orchards in the areas which are under well-irrigation. Sorghum and sugarcane are the main crops in irrigated areas. The dominant grasses include *Aristida* spp., *Sehima nervosum*, *Heteropogon contortus*, *Dichanthium annulatum* and *Chrysopogon fulvus*, interspersed with scattered scrubland.

METHODOLOGY

We conducted a survey of the wolf and its prey in Solapur and its adjoining districts during November-December 1993. Information on the presence of wolf, breeding, number, natural prey, livestock density, and public attitude were taken on a set proforma through enquiring and/or by ground surveys. Forest Department personnel, villagers, particularly shepherds, were interviewed. Information collected from people was cross-checked by ground surveys by looking for scats and tracks, and sightings or howling. Those areas where wolf presence was not expected, such as intensive agriculture areas, were not surveyed intensively. In such areas, the crop is harvested twice a year and the area is always occupied and frequented by humans. To avoid over estimation, the queries with one source about wolf numbers were tallied with information gathered from other sources in a particular area.

The maximum possible information was sought from shepherds about the frequency of wolf sighting in a particular area, constancy of the pack-size, and wolf breeding in the area. If we found evidence of denning in a particular area, we accompanied the informer up to the den sites and the necessary information was collected.

All the eleven sub-divisions (*tehsils*) of Solapur district were surveyed thoroughly and the areas wherein wolf presence was known to us were checked with intensive search operations by looking for tracks and scats (as sighting is rare). The sub-divisions are: Akkalkot, Barshi, Karmala, Madha, Malshiras, Mohol, Mangalvedha, North Solapur, Pandharpur, Sangole and South Solapur. Malshiras, Sangole and Barshi *tehsils* have steep hills and the rocks are in the form of medium to large-sized boulders. Akkalkot, Pandharpur, Mangalvedha and Madha have the largest agriculture belts, thanks to the development of irrigation facilities. The crops are also irrigated from the river Bhima in these sub-divisions. These areas have incurred heavy increase in cultivated area and the grasslands are continuously being converted into crop fields because of improved irrigation facilities.

In addition to the revenue land and grazing land, plantations totalling 5,125 ha were surveyed. A distance of 2,776 km was covered by vehicle during the survey and indirect evidence of wolf was found. These plantations were dispersed over a large area of grassland and crop fields.

The wolves found within 20 km radius around villages were considered as one pack moving over these areas. This was tallied/confirmed with the number of wolves seen in these villages also (i.e., if the same number of wolves was sighted around 4-5 villages, it was considered as one pack). Altogether, 398 people were interviewed about the wolves and their whereabouts.

RESULTS AND DISCUSSION

The wolf is present in all sub-divisions of Solapur (Fig. 2). The results of the survey for population estimates and density in different areas are given in Table 1. Solapur district supports a minimum population of 53 and maximum of 85 wolves. Out of these figures, the packs that are present along the district boundaries (e.g., with Ahmednagar, Satara, Sangli and Osmanabad) and the state border (Karnataka) contribute to populations of either side. Much of the range is

TABLE 1
APPROXIMATE DENSITY OF WOLVES AND POPULATION OF NATURAL PREY IN SOLAPUR SUB-DIVISIONS

Subdivisions	Area** (km ²)	Wolf Numbers	Density (km ²)	Natural prey	
				Blackbuck	Chinkara
Akkalkot	169.26	5-8	0.04	30-50*	—
Barshi	246.09	6-7	0.03	100-120*	(2)
Karmala	278.71	5-9	0.03	400-500* (300-400)	(11)
Madha	287.77	2-4	0.01	200-250*	—
Malshiras	362.05	7-12	0.03	Not known	(2)
Mangalvedha	169.26	2-4	0.02	Not known	—
Mohol	229.38	6-8	0.03	2000* (500-550)	—
Pandharpur	219.21	2-4	0.01	about 500 (76)	—
Sangole	164-98	7-10	0.05	Not known	—
Solapur North	242.03	7-12	0.04	1000-1200* (700±)	—
Solapur South	151.86	4-7	0.04	150-200* (182)	—

* represents the numbers supplied by the local people and the Forest Department

** wolf habitat or area available to wolves

Numbers in parentheses represent our observations



Fig. 2. Map showing the distribution of grey wolf in the subdivisions of Solapur District, Maharashtra

inhabited by low pack sizes. The largest pack size comprised of 12 wolves and smallest of two individuals. The low pack size is probably because of the high human populations in such areas and disturbance. Moreover, the natural prey base and livestock (goat and sheep) are also low in these areas. There was no constancy in the pack size in any area of the wolf range as reported by other workers. For example, the Nannaj pack that was followed for behavioural studies did not remain constant over the year (Kumar unpubl. data). Most sightings during winter were of only two animals. We presume that this might be a result of more activity of the alpha pair of a pack, or the only pair (lone pair) of an area, searching for denning sites.

The blackbuck (primary prey of the wolf) is in low numbers in most of the wolf range areas of Solapur, except Mohol and North Solapur sub-divisions which harbour large populations of blackbuck (Table 1). Indian gazelle or chinkara (*Gazella bennettii*) was seen only in three sub-divisions of Solapur (Table 1) in extremely low numbers.

Six dens were located with the help of shepherds and watchmen of the Forest Department. In addition, there was one den along the periphery of a plantation at Sohale in Mohol, wherein the wolves were denning over the years. However, this den got destroyed because of a check-dam that came up in the area in 1993. Likewise, a den was destroyed around Katphal (Sangole) plantation because of the irrigation canal (called Nira) that made its way through the den. In 1992, two pups were seen by a forest guard at the same den. We were told that this den was also being used for many years by wolves.

About 12-15 years ago, the wolf disappeared from Achegaon and surrounding villages in South Solapur and Narliwadi and surrounding areas of Sangole tehsil, apparently because of agricultural expansion and change in cropping pattern. For the same reason, the range of the wolf has shrunk in Mangalvedha and Madha tehsils. Breeding was noticed only in

Akkalkot, Madha, Malshiras, Sangole and North Solapur tehsils, which still have extensive areas under marginal cultivation.

After being bitten by a wolf in 1991, a young shepherd of Jalbhavi village died in September 1993 due to rabies. There was a pack of 14 wolves in 1991 in this village area. In recent years, this is apparently the first and only case of human casualty by the wolf in Solapur district.

CONSERVATION

Malshiras, Sangole, North Solapur and Akkalkot are the best areas for the long term survival of the wolf because of availability of prey and denning sites. Among these areas, Malshiras and Sangole have steep hills along adjoining districts and have massive rock boulders. The soil under these boulders has a soft texture which helps the wolves to excavate it for making dens. According to local people and also our observations the wolves use the same dens year after year. The livestock population in each of these ranges is more than 20,000, which provides regular food.

The wolf is a highly endangered species, protected under the Wildlife (Protection) Act, 1972, but till now, not much has been done for its protection, mainly because of its reputation as a livestock destroyer, and in some areas as a child-lifter. Fortunately, in Solapur district, no case of child lifting has been reported as far as we know, but its so-called sheep and goat depredation makes it an unpopular animal. During the survey, all the people interviewed responded with a negative attitude towards wolf conservation.

Despite continuous persecution by human beings, the wolf has the resilience to survive, chiefly due to its adaptability and intelligence. The wolf, like the Great Indian bustard *Ardeotis nigriceps* and blackbuck, has responded positively to conservation measures (in the form of plantation and grassland plots developed under various schemes). However, this has not reduced

human-wolf conflict — the ultimate victim of which is invariably the wolf. It is a complex issue, without an easy solution. Nevertheless, we recommend the following steps which might minimize human-wolf conflict and increase the wolf's chance of survival:

- (1) Adequate compensation for wolf depredation of livestock.
- (2) Translocation of blackbuck from locally-abundant areas to other suitable unoccupied habitats.
- (3) To reduce human-blackbuck conflict, compensation for crop-damage by blackbuck.
- (4) Special protection to denning sites and core areas which are generally occupied by wolves.
- (5) Development of large grassland and plantation plots, especially around denning sites used regularly by wolves.
- (6) Intensive studies on the movement,

dispersal, habitat requirements and general ecology of the wolf in Maharashtra, using modern techniques of radio-telemetry and marking.

- (7) Regular wolf census in Maharashtra, at least once in two years.

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